

Amendments to the Drawings:

The attached sheets of Figure 1 and Figures 2 - 4 include corrections to Figure 1 and Figure 4 as indicated below.

In Figure 1, element numbers for centrally positioned partitions 17, 63, 65, 67 and 61 are included for spacers 12, 20, 34, 44, and 56. Each partition is illustrated as having aligned holes therein, as indicated by element 69. In regards to spacer 12, a separate lead line and element number 14' is added. In regards to spacer 56, elements 14 and 14 are deleted, with each aperture identified as 58, 58'.

In Figure 4, the partition between the two apertures is illustrated as having aligned holes therein, as indicated by element 69.

Applicant has amended the specification at paragraphs [0020], [0021], [0022], [0025], [0028], [0031] and [0035] to include appropriate references for holes 69 in each respective partition and respective mid-portions of membrane surfaces as illustrated in the corrected figures.

Attachments: Replacement sheets (six sheets)
 Annotated sheets showing corrections (two sheets)

Remarks/Arguments

Amendments to the Specification:

The Applicant respectfully submits amended paragraphs [0020], [0021], [0022], [0025], [0028], [0031], and [0035] for entry into the present application. Amendments to the above referenced paragraphs are supported by Figure 4 and 7a - 7g, and the specification at paragraph [0035], stating that the cell stack 10 is depicted as it is mounted with threaded bolts 68 between an opposed pair of electrolyte flow distribution endplates 70a and 70b. The insertion of threaded bolts 68 through the partition of each split cell spacer of the cell stack 10 inherently requires a plurality of bolt holes extending through the cell stack 10 in register with the holes illustrated in Figure 4, and as further clarified in the amendments to paragraphs [0020], [0021], [0022], [0025], [0028], [0031], and [0035].

Amendments to the Drawings:

The attached sheets include corrections to Figures 1 and 4, as explained hereinabove. Applicant respectfully requests approval of the replacement Figures.

Claim Rejections 35 U.S.C. §102(b):

The Examiner retained the rejections of Claims 1 - 4, and 7 - 12 under 35 U.S.C. §102(b), as being anticipated by Goldstein (U.S. Patent 6,117,297), as previously stated by the Examiner in the Office Action mailed March 10, 2004. Applicant amends Claim 1 to include limitations of prior Claim 5, which is cancelled without prejudice. Applicant amends Claim 7 to include limitations of prior Claim 10, which is cancelled without prejudice. Applicant amends Claim 11 to include limitations presented in prior Claims 5 and 10. Applicant respectfully submits amended Claims 1 - 4, 7 - 9 and 11 - 12, are not anticipated by Goldstein due to the

lack of each and every element of the amended claims being found in a single prior reference.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."

Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). [Also see MPEP § 2131.]

Applicant acknowledges the rejection of Claims 1 - 4 and 7 - 12 under 35 U.S.C. §102(b), as presented in Examiner's response to Applicant's arguments filed June 2, 2004. Applicant respectfully submits Goldstein does not disclose use of one or more removable connectors centrally connecting a plurality of membranes and interleaved spacer layers in a cell stack, as presented in amended Claims 1, 7 and 11.

Goldstein discloses a monolithic frame that is composed of solid frame materials (18) (see col. 22, lines 66-67, and col. 23, lines 1-4), which are bonded to form a monolithic, integral frame (see col. 23, lines 36-37 and lines 58-59), by heating in an oven until the frame surfaces which contact each other are fused together (see col. 29, lines 54-57, and col. 30, lines 1-5). Goldstein further discloses the multi-layered cells are retained by a multitude of layers of frames bonded into an integral, monolithic frame which is welded thermally, or ultrasonically, or by laser means (see col. 35, lines 25-30). The frame taught by Goldstein is not readily disassembled when one or more interleaved layers fail. If the frame taught by Goldstein is disassembled, the fused frame surfaces will be torn upon separation.

Goldstein does not disclose and expressly teaches away from Applicant's amended Claims 1, 7 and 11, which provide an electrodialysis system including a plurality of membranes interleaved with spacers defining a plurality of cells through which one or more connectors are removably inserted through one or more holes in partitions separating apertures of each spacer included in the stacked cell.

Further, Applicant's amended Claims 1, 7 and 11 provide a stacked cell which is readily assembled and disassembled for maintenance on any of the interleaved layers. In addition, Applicant's claimed configuration of connectors extend through each partition of respective spacers layered in a cell stack, and provides a uniform force distribution over the gasket area, thereby improving sealing between interleaved membranes and improving ion removal efficiency, while reducing assembly labor time, as disclosed in Applicant's application (see paragraph [0052]), and as emphasized by the Applicant's concurrently submitted Declaration filed under 37 C.F.R. §1.132.

Applicant's amended Claims 1, 7 and 11 include limitations not disclosed in Goldstein, nor taught in Schmidt et al. (U.S. 6,274,020, discussed herein). Applicant respectfully submits amended Claims 1, 7 and 11 are not anticipated by Goldstein due to the lack of each and every element set forth in the amended claims. Accordingly, the Examiner's rejections under 35 U.S.C. §102(b) are traversed, and Applicant respectfully requests withdrawal of rejections under 35 U.S.C. §102(b), thereby placing amended Claims 1, 7 and 11 in condition for allowance. Further, Claims 2 - 4, 6, 8 - 9 and 12 are in condition for allowance as being dependent either directly or indirectly from allowable base claims.

Claim Rejections Under 35 USC §103(a):

The Examiner rejected Claims 5 - 6 under 35 USC §103(a) as being unpatentable over Goldstein, and further in view of Schmidt et al. (U.S. 6,274,020).

Applicant cancels Claim 5, without prejudice, and amends Claim 6 to depend from amended Claim 1, deemed to be in condition for allowance. Applicant respectfully submits that Goldstein, either separately or in combination with Schmidt et al., does not disclose, suggest or teach the limitations of amended Claim 6, and does not disclose, suggest or teach the limitations of amended independent Claim 1.

In order to support a rejection under 35 U.S.C. § 103(a), “the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.” MPEP § 2142, pg. 2100-121, 8th ed. “To reach a proper determination under 35 U.S.C. § 103(a), the examiner must step backward in time and into the shoes worn by the hypothetical ‘person of ordinary skill in the art’ when the invention was unknown and just before it was made.” *Id.* The first element in establishing a *prima facie* case of obviousness is that “there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings.” MPEP § 2143, pg. 2100-122, 8th ed. The second element is that there “must be a reasonable expectation of success.” *Id.* The third element is that “the prior art reference (or references when combined) must teach or suggest all the claim limitations.” *Id.*

The relevant facts for finding obviousness relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of non-obviousness such as long felt need, commercial success, the failure of others, or copying. Graham v. John Deere Co., 148 U.S.P.Q. 459, 467 (1966; see Continental Can Co. v. Monsanto Co., 20 U.S.P.Q.2d 1746, 1750-51 (Fed. Cir. 1991). The Supreme Court in Graham stated that “the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be

ascertained; and the level of ordinary skill in the pertinent art resolved.” Graham, 383 U.S. at 17, 148 U.S.P.Q. at 467. The Graham court further stated that “[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy.” Id.

In support of the Applicant's amended claims being in condition for allowance over Goldstein in view of Schmidt et al., Applicant submits that in the Office Action mailed March 10, 2004, the Examiner stated that Goldstein discloses the cell is bonded together and does not use bolts. The multi-layered cells taught by Goldstein are retained together as membrane layers bonded at perimeters to form an integral, monolithic frame-membrane; therefore the frame and each bonded membrane are not readily disassembled when an intermediate layer fails. The Examiner further stated in the Office Action mailed March 10, 2004, that Schmidt et al. teaches that bolts are utilized to form an electrodialysis cell. Applicant respectfully submits that Schmidt et al. teaches a membrane cell stack retained in a support frame having connector rods (16, 16') extended through outer edges of membrane cell stack (see col. 7, lines 46-52).

Schmidt et al. does not teach, suggest or disclose one or more connectors extended through holes disposed in positions other than the outer edges of the membrane stack. Further, Schmidt et al. teaches gaskets (30, 36, 44, 52, 60) having open center portions lacking a partition interdisposed within each gasket interior, in order to provide an uninterrupted flow path across each gasket for directed flow between opposed corners of each respective gasket (see Figs. 4 and 5 of Schmidt et al.). The open center portion of each gasket of Schmidt et al. teaches away from the configuration of Applicant's electrodialysis system of amended Claims 1, 7 and 11,

including spacers having gaskets defining at least a first and second aperture separated by at least one partition. Applicant's claimed gasket configuration provides for each gasket aperture defining an independent cell between interleaved membranes through which multi-path flow communication occurs in series or parallel as claimed in new Claims 15 and 16, for improved efficiency of removal of contaminants and ions from fluids (see Applicant's application, paragraphs [0011], [0016], [0038], and [0050]).

As explained in a concurrently submitted Declaration filed under 37 C.F.R. §1.132, Applicant declares that the conventional method of securing a plurality of membranes, spacers, and anode and cathode layers to form an electrodialysis membrane cell stack is to bond the cell layers together, as taught by Goldstein, or to utilize bolts or connectors positioned around a perimeter of the cell stack, as taught by Schmidt et al. The Declaration provides expert testimony by the Applicant, being an expert skilled in the art have not successfully secured an electrodialysis cell stack, that as of the time of the filing of the pending patent application there was not a prior patent or disclosure in the published literature of Applicant's claimed invention including a plurality of membranes interleaved with spacers and gaskets defining at least two apertures separated by at least one partition through which one or more removable connectors are centrally inserted for retention of the assembled cell stack.

Applicant respectfully submits that Goldstein, either separately or in combination with Schmidt et al., does not disclose, suggest or teach the limitations of amended Claim 6, depending from amended Claim 1, including limitations which are not made obvious by Goldstein, either separately or in combination with Schmidt et al. Accordingly, the Examiner's rejections under 35 U.S.C. §103(a) have been traversed, and Applicant respectfully requests withdrawal of rejections under 35 U.S.C. §103(a), thereby placing amended Claim 6 in condition for allowance.

New Claims:

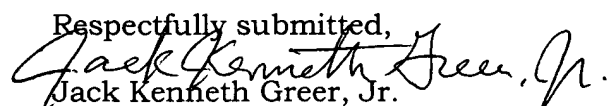
Applicant submits new Claim 13 to be dependent from amended Claim 11, and submits new Claims 14 - 16, for Examiner's review and entry in the application. It is submitted that new Claim 13 is in condition for allowance as being dependent from an allowable base claim, amended Claim 11.

New Claim 14 is submitted to be in condition for allowance as including limitations not disclosed in Goldstein, nor taught in Schmidt et al., as discussed hereinabove. It is submitted that new Claims 15 and 16 are in condition for allowance as being dependent from an allowable base claim, amended Claim 14.

Summary:

Applicant submits for the Examiner's review and entry into the application: (a) amendments to the specification, (b) amendments to independent Claims 1, 7, 11, (c) cancellation of Claims 5 and 10 without prejudice, (d) corrections to Figures 1 and 4, and (e) new Claims 13 - 16. Applicant respectfully submits the above-identified application is in condition for issuance of a Notice of Allowance. Such action by the Examiner is respectfully requested. If, however, the Examiner is of the opinion that further discussion of the present application as now presented is in order, it will be appreciated if the Examiner will telephone the undersigned to expedite the prosecution of the application. Please charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 16-1910.

Respectfully submitted,


Jack Kenneth Greer, Jr.
Registration No. 42,605

PITTS AND BRITTIAN, P.C.
P.O. Box 51295
Knoxville, Tennessee 37950-1295
(865) 584-0105 Voice
(865) 584-0104 Fax

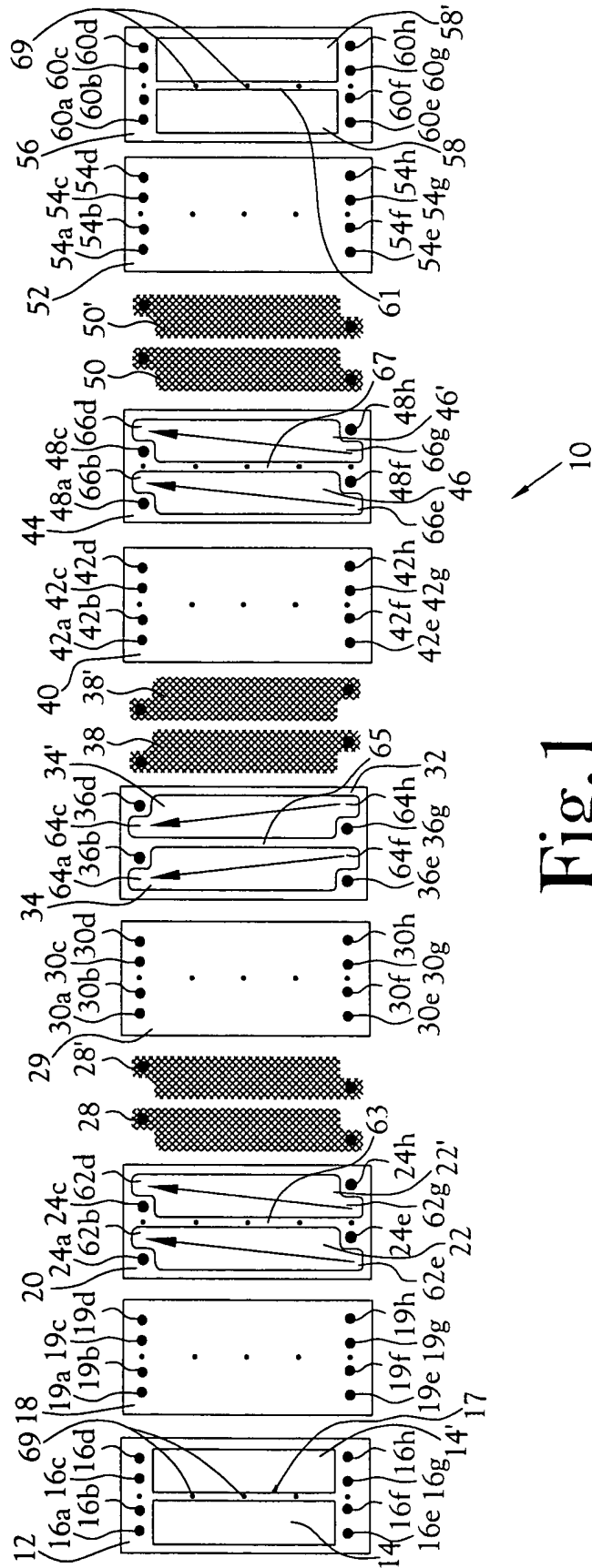


Fig. 1

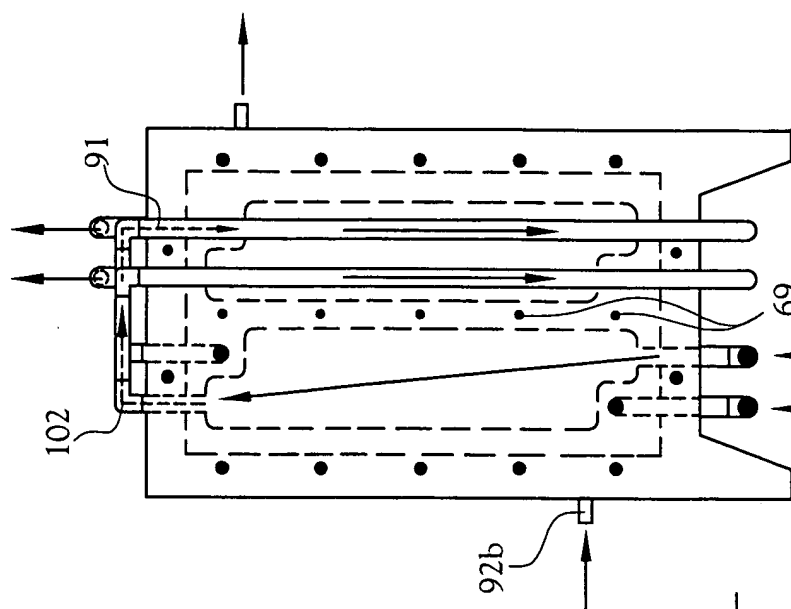


Fig. 2

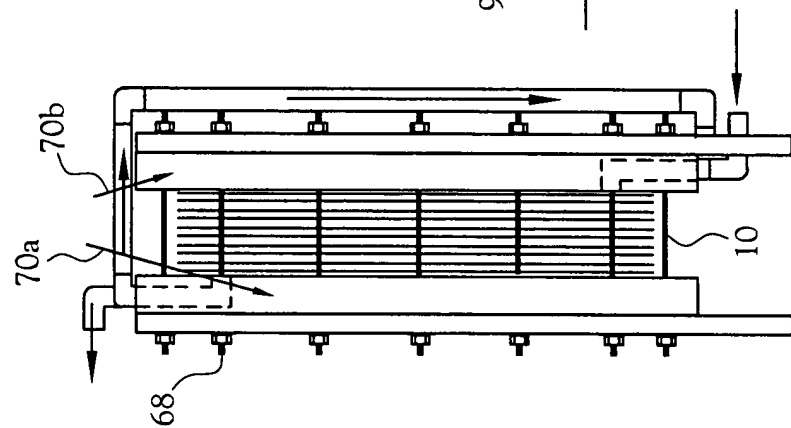


Fig. 3

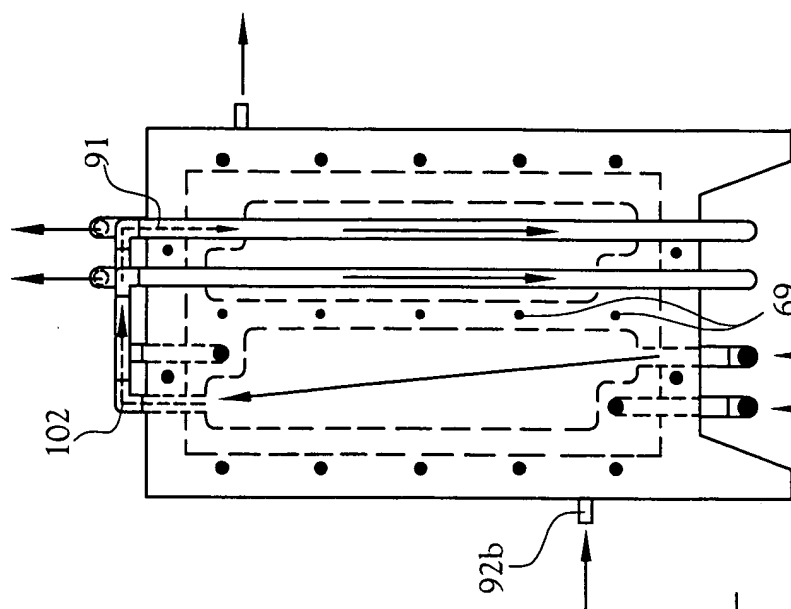


Fig. 4